

REMARKS

Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 1-42 are pending in the subject application.

Claims 1-42 stand rejected under 35 U.S.C. §102 and/ or 35 U.S.C. §103. Claim 17 was objected to because of an identified informality.

Claim 8 was amended to correct a possible antecedent basis concern.

Claim 17 was amended as suggested by the Examiner to address the Examiner's objection.

Claims 24, 31 and 34 were amended to correct typos.

The amendments to the claims are supported by the originally filed disclosure.

35 U.S.C. §102 REJECTIONS

Claims 1, 3-6, 8-9, 16-19, 21-23 and 29 stand rejected under 35 U.S.C. § 102 as being anticipated by the cited art for the reasons provided on pages 2-8 of the above-referenced Office Action. Because claims were amended in the foregoing amendment, the following discussion refers to the language of the amended claim(s), however, only those amended features specifically relied on in the following discussion shall be considered as being made to overcome the prior art reference. The following addresses the specific rejections provided in the above-referenced Office Action.

CLAIMS 1, 3-6, 8-9 & 16-19

Claims 1, 3-6, 8-9 and 16-19 stand rejected under 35 U.S.C. §102(e) as being anticipated by Veritas Volume Replication and Oracle Databases, a Solution White Paper, by Paul Massiglia, Verritas Software Co., May 29, 2000 [hereinafter “Massiglia”] for the reasons provided on pages 2-6 of the above referenced Office Action. Applicants respectfully traverse.

Applicants claim, claim 1, a method for writing file systems write data operations to a storage medium including storing a file systems write data operation in a first temporary data store, mirroring the file systems write data operation in a second temporary data store and deleting the mirrored file systems write data operation from the second temporary data store in the case when the file systems write data operation is successfully written from the first temporary data store to the storage medium.

As asserted in the above-referenced Office Action, the first two steps of the method of claim are found in Fig. 3 of Massiglia and the last step is found in Fig. 4 and the identified discussion on page 19 of Massiglia. Applicants respectfully submit that Massiglia does NOT disclose inherently or explicitly the last two steps of the method of the present invention.

The second step of the present invention provides that write data operation being written to the first temporary data store is mirrored or written in a second temporary data store. The assertion that the write data operation is stored in a temporary data store is incorrect because, and as admitted in the Office Action, Massiglia is directed to replicating databases in two different storage mediums as illustrated in figures 1-2 thereof, for example. In such a system, whether

write operations are done synchronously or asynchronously, the goal of the systems is to provide two storage mediums and to completely duplicate the contents of one storage medium in the second storage medium. In this way, one can recover from a complete loss of the first storage medium.

As to the third step of claim 1, it is provided that the mirrored file systems write data operation is *deleted* from the second temporary data store in the case where the file systems write data operation is successfully written from the first temporary data store to the storage medium. As indicated above, Massiglia is concerned with obtaining duplicative databases, there is no mention anywhere in Massiglia that the data being stored in the duplicate storage medium is to be deleted if, and when, it is determined that the write operation from the first temporary data store to the storage medium has been successful.

The discussion on page 19 in the section entitled Storage Replication Log Overflow has nothing to do with deleting write operations but rather concerns what to do with replication operations when the SRL becomes filled. The discussion does not talk about deleting write operations to the second storage medium when the write operation to the first storage medium is completed but rather the opposite. Further, the discussion on page 16 of Massiglia indicates that the Volume Replicator at the primary site, which includes a storage medium, logs all requests to replicated volumes (*i.e.*, a second storage medium) in a Storage Replicator Log (SRL) before sending them to secondary sites. It is further provided that the SRL is the Volume Replicator's mechanism for riding through transitory network outages and overloads.

In addition, it should be noted that in the case of figures 3 and 4 of Massiglia, there is no reference or statement therein regarding deletion of the write data operation from a second storage medium after writing to the first data storage medium is complete. There also is no express reference in these figures of Massiglia to the writing of a write data operation to a temporary data store as part of the write process as well.

As indicated herein, Massiglia discloses and teaches writing data to two storage mediums. While write operations can include a write to a temporary data store for performance reasons, before the data is written to the storage medium, the contents of such a temporary data store is typically not cleared until it is determined that the write operation to the particular storage medium has been completed. Thus, if there was a second temporary data store in Massiglia, its contents would not be deleted until after it is determined that the write operation to the second storage medium was completed.

In sum, Massiglia discloses and teaches permanently and duplicatively writing data to two storage mediums. Massiglia nowhere describes mirroring a write data operation in a second temporary data store and then deleting this write data operation from the second temporary data store if the write operation between the first temporary data store and the storage medium is successful. In addition, to not disclosing this it should be noted that such an operational mode would destroy the volume replication system and methodology disclosed and taught in Massiglia.

Applicants respectfully submit that at least because of the dependency from a base claim that is believed to be allowable, each of claims 3-6 and 8-9 also are considered to be allowable.

Applicants do, however, make the following additional observations regarding these dependent claims.

Claim 6 provides that the storage medium is serviced by a plurality of servers and that each server includes the first and second temporary data stores. In this regard, and as indicated above, in Massiglia there is a server for the storage medium at the principal site and a server and storage medium for each secondary site. Thus, it necessarily follows that it is inherently impossible for Massiglia to disclose or describe the methodology set forth in claim 6.

Applicants respectfully submit that the foregoing remarks distinguishing claims 1, 3-6 and 8-9 also apply to distinguish each of claims 16-19 from Massiglia. In this regard, Applicants would note that at least with respect to the last step of claim 16, which is essentially the same as the limitations of claim 2, the Office Action constructively admits that Massiglia cannot anticipate claim 16.

It is respectfully submitted that claims 1, 3-6, 8-9 and 16-19 are patentable over the cited reference for the foregoing reasons.

CLAIMS 21-23 & 29

Claims 21-23 and 29 stand rejected under 35 U.S.C. §102(e) as being anticipated by Sun Cluster 3.0 U1 Concepts, Sun Microsystems™, July 2001 [hereinafter "Sunclus"] for the reasons provided on pages 2-6 of the above referenced Office Action. Applicants respectfully traverse.

Applicants claim, claim 21, a system for writing file systems write data operations, comprising a storage medium, a plurality of servers servicing the storage medium, each server including a first temporary data store and a second temporary data store, and a communications link. The communications link is configured and arranged so as to communicatively interconnect the first temporary data store of one of the plurality of servers to the second temporary data store of another of the plurality of servers and to communicatively interconnect the first temporary data store of said another of the plurality of servers to the second temporary data store of said one of the plurality of servers. As described in the subject application, the temporary data stores are provided to cache a given write data operation, while the write data operation is being written one of the first temporary data stores to the data storage medium.

While Sunclus discloses a cluster server type of environment and communication interconnects between cluster servers, there is no disclosure or illustration in either of figures 2-1 or 3-1 thereof that shows that each server includes a first temporary data store and a second temporary data store. There also is no disclosure or illustration of a communications link that interconnects the first temporary data store of one server to the second temporary data store of the other server.

Although Figure 2-1 does illustrate that a server can include a plurality of storage interfaces, each of these interfaces is coupled to storage medium, either a local disk or a multi-host disk. It necessarily follows that a first temporary data store provided in a server for caching the write data operation to a given storage device connected to that storage medium is only shown as being interconnected to the particular storage medium and nowhere else.

Figure 3-1 of Sunclus is an illustration of the software architecture. The architecture while showing that there is an interconnect to other nodes, does not show that the software communicates with two temporary data stores in a server or that there is an interconnect between a temporary data store in one server with another temporary data store in another server.

Further, the discussion on page 24 of Sunclus regarding the cluster interconnect provides that the cluster interconnect is the physical configuration of devices used to transfer cluster-private communications and data service communications between cluster nodes. It is further indicated that because the cluster interconnect is used extensively for cluster-private communications, it can limit performance. The further descriptions and discussions in Sunclus make clear that such communications do not involve the transfer of data or write data operations between temporary storage media of different nodes (e.g., see pages 50-65 of Sunclus).

In sum, while Sunclus is descriptive of a cluster network environment, it is completely silent as to the concept and arrangements of the present invention as set forth in claim 21. This is not surprising as Sunclus is directed to the hardware and software provided by a particular manufacture for its cluster solution.

Applicants respectfully submit that at least because of the dependency from a base claim that is believed to be allowable, each of claims 22-23 and 29 also are considered to be allowable. Applicants do, however, make the following additional observations regarding these dependent claims.

Claim 22 adds the further limitations that the communications link is two separate communication interconnections or paths. One interconnection couples the first temporary data

store of one server and the second temporary data store of another server and another interconnection couples the first temporary data store of the another server and the second temporary data store of the one server. This clearly is not shown either in figures 2-1 or 3-1 of Sunclus.

It is respectfully submitted that claims 21-23 and 29 are patentable over the cited reference for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided in MPEP-2131, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegel Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Or stated another way, "The identical invention must be shown in as complete detail as is contained in the ... claims. *Richardson v Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ 2d. 1913, 1920 (Fed. Cir. 1989). Although identify of terminology is not required, the elements must be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). It is clear from the foregoing remarks that the above identified claims are not anticipated by either of the two cited references.

It is respectfully submitted that for the foregoing reasons, claims 1, 3-6, 8-9, 16-19, 21-23 and 29 are patentable over either of the two cited reference(s) and thus satisfy the requirements of 35 U.S.C. §102. As such, these claims, including the claims dependent therefrom are allowable.

35 U.S.C. §103 REJECTIONS

Claims 1, 7, 10-15, 20, 24-28 and 30-42 stand rejected under 35 U.S.C. § 103 as being unpatentable over the cited art for the reasons provided on pages 8-24 of the above-referenced Office Action. Because claims were amended in the foregoing amendment, the following discussion refers to the language of the amended claim(s), however, only those amended features specifically relied on in the following discussion shall be considered as being made to overcome the prior art reference. The following addresses the specific rejections provided in the above-referenced Office Action.

CLAIMS 2, 7, 10

Claims 2, 7 and 10 stand rejected as being unpatentable over Massiglia in view of Sun Storedge™ Network Replicator 3.0 System Administrator Guide, Sun Microsystems™, June, 2001 [hereinafter “Sundar”] for the reasons provided on pages 8-10 of the above referenced Office Action. Applicants respectfully traverse.

Claims 2, 7 and 10 each depend directly or ultimately from claim 1. As indicated above in regards to the §102 rejection of claim 1, Massiglia does not disclose the method of claim 1. Applicants also submit that Massiglia does not teach nor suggest the method of claim 1 and also that there is no teaching, suggestion or motivation offered in Massiglia to modify the methodology disclosed therein so as to yield the method of claim 1. As such at least because of the dependency from a base claim that is believed to be allowable, each of claims 2, 7 and 10 also are considered to be allowable.

As to claim 2, it is admitted in the Office action that Massiglia does not specifically teach writing data from the secondary to the primary in the case when the file systems write operation is not successfully written from the first temporary data store. It is further asserted that Sundar supplies the missing teachings and that it would have been obvious to combine the teachings of Sundar with Massiglia so as to yield the method of claim 2. Applicants respectfully traverse the characterization of the teachings of Massiglia as well as that one skilled in the art would have been motivated to modify the teachings of Massiglia based on the teachings of Sundar.

As indicated above, Massiglia discloses and teaches a system and method for *replicating* data or information located on one storage medium, and serviced by one server or computer, on another storage medium that also is being serviced by a different server. In other words, what is disclosed and taught in Massiglia is performing duplicate write operations on each of the two storage mediums being connected to their respective servers. In sum, it is inherently impossible for Massiglia to teach or suggest write-operations in a cluster type of environment where writing is affected to the storage medium in common to the cluster of servers.

Also, the write operation described in Massiglia for the secondary devices involves sending the write operation to the second server or computer so the server causes the data to be written to the storage medium connected to the second server. Thus, there also can be no teaching in Massiglia to write data received by the second server to the storage medium operably coupled to only the first server.

Massiglia while disclosing and teaching replication, also necessarily discloses and teaches maintaining an independence between the primary and secondary sites so as to permit disaster

recovery. Given the above, it can hardly be said that one skilled in the art would have been motivated to cause the second server to initiate a write operation on the first storage medium that is connected to the first server merely because of the alleged teachings of Sundar. In particular, when such teachings would essentially completely undercut if not destroy the intend purpose of replication being taught and disclosed in Massiglia.

Also the teachings referred to in Sundar, specifically describe a disaster recovery process whereby the secondary site takes over. Therein it is provided on page 74 that application-level recovery procedures are to be started as part of this process to ensure a consistent starting point for future operations. It also is stated at page 66 thereof, that if the interruption is of a larger rolling disaster avoid resynchronization of the sites, and maintain the secondary site in a dated but consistent state, rather than risk a disastrous interruption that leaves the secondary site inconsistent and difficult to recover from. As such, the suggestion that Sundar discloses having the secondary site initiate a write operation to the storage medium at the primary site is inconsistent with Sundar.

It is respectfully submitted that claims 2, 7 and 10 are patentable over the cited reference(s) for the foregoing reasons.

CLAIMS 11-15, 31 & 33

Claims 11-15, 31 and 33 stand rejected as being unpatentable over Massiglia in view of Sundar for the reasons provided on pages 10-14 of the above referenced Office Action.

Applicants respectfully traverse.

Applicants claim, claim 11, a method for writing file systems write data operations to a storage medium including storing a file systems write data operation in a first temporary data store; mirroring the file systems write data operation stored in a second temporary data store; determining if the file systems write data operation stored in the first temporary data store is successfully written to the storage medium; deleting the file systems write data operation from the second temporary data store when it is determined that the file systems write data operation was successfully written from the first temporary data store to the storage medium; and writing the mirrored file systems write data operation from the second temporary data store to the storage medium when it is determined that the file systems write data operation was not successfully written from the first temporary data store to the storage medium.

Applicants respectfully submit that the remarks above distinguishing each of claims 1 and 3 from Massiglia and claim 2 from the combination of Massiglia and Sundar also apply to distinguish claim 11 from the combination of Massiglia and Sundar. As was indicated above, the temporary data stores of the present invention cache the write data operation being inputted to both of the first and second data temporary data store. Thus, when it is determined that the write data operation being cached in the first temporary data store is successfully written to the storage medium, then according to the method of the present invention the write data operation that was being stored in the second temporary data store is deleted. However, if it is determined that the write data operation being cached in the first temporary data store was not successfully written to the storage medium (*e.g.*, the server containing the first temporary data store failed), then

according to the method of the present invention the write data operation cached in the second temporary data store is carried out and inputted to the storage medium.

The foregoing is not disclosed nor taught anywhere in Massiglia nor in Sundar. This is not surprising as both of these references embody the techniques of replication and synchronization of two storage mediums to accomplish disaster recover.

It is respectfully submitted that claims 11-15, 31 and 33 are patentable over the cited reference(s) for the foregoing reasons.

CLAIM 20

Claim 20 stands rejected as being unpatentable over Massiglia in view of Sunclus for the reasons provided on pages 14-15 of the above referenced Office Action. Applicants respectfully traverse.

Claim 20 depends directly from claim 16. As indicated above in regards to the §102 rejection of claim 16, Massiglia does not disclose the method of claim 16. Applicants also submit that Massiglia does not teach nor suggest the method of claim 1 and also that there is no teaching, suggestion or motivation offered in Massiglia to modify the methodology disclosed therein so as to yield the method of claim 16. As such at least because of the dependency from a base claim that is believed to be allowable, claim 20 also is considered to be allowable.

The secondary reference Sunclus, as indicted above in connection with the §102 rejection of claims 21-23 and 29, while descriptive of cluster network environments is completely silent as to the concept and arrangements of the present invention. This is not surprising as Sunclus is

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directed to the hardware and software provided by a particular manufacture for its cluster solution and nothing further.

It is respectfully submitted that claim 20 is patentable over the cited reference(s) for the foregoing reasons.

CLAIMS 24-28 & 30

Claims 24-28 and 30 stand rejected as being unpatentable over Sunclus in view of Massiglia for the reasons provided on pages 15-18 of the above referenced Office Action. Applicants respectfully traverse.

Claims 24-28 and 30 each depend directly or ultimately from claim 21. As indicated above in regards to the §102 rejection of claim 21, Sunclus does not disclose the system for writing file systems write data operations as set forth in claim 21. Applicants also submit that Sunclus does not teach nor suggest the system of claim 21 and also that there is no teaching, suggestion or motivation offered in Sunclus to modify the system disclosed therein so as to yield the system of claim 21. As such at least because of the dependency from a base claim that is believed to be allowable, each of claims 24-28 and 30 also are considered to be allowable.

As to the secondary reference Massiglia, Applicants refer to the remarks above regarding claims 1-3. As was indicated above, the temporary data stores of the present invention cache the write data operation being inputted to both of the first and second data temporary data store. Thus, when it is determined that the write data operation being cached in the first temporary data store is successfully written to the storage medium, then according to the method of the present

invention the write data operation that was being stored in the second temporary data store is deleted. However, if it is determined that the write data operation being cached in the first temporary data store was not successfully written to the storage medium (*e.g.*, the server containing the first temporary data store failed), then according to the method of the present invention the write data operation cached in the second temporary data store is carried out and inputted to the storage medium.

It is respectfully submitted that claims 24-28 and 30 are patentable over the cited reference(s) for the foregoing reasons.

CLAIM 32

Claim 32 stands rejected as being unpatentable over Massiglia in view of Sundar and further in view of Sunclus for the reasons provided on pages 18-19 of the above referenced Office Action. Applicants respectfully traverse.

Claim 32 depends directly from claim 31. As indicated above in regards to the §103 rejection of claim 31, the combination of Massiglia and Sundar do not disclose the program, more particularly the program's instructions and criteria, of claim 31. Applicants also submit that the cited combination also does not teach nor suggest the program/ program's instructions and criteria of claim 31 and also that there is no teaching, suggestion or motivation offered in the cited combination to modify that disclosed in the principal reference so as to yield the program/ program's instructions and criteria of claim 31. As such at least because of the dependency from a base claim that is believed to be allowable, claim 32 also is considered to be allowable.

Claim 32 adds the further limitations that the program further includes instruction and criteria for monitoring an operational status of each of the servers of the cluster, and causing the writing of mirrored file systems write data operation from the second temporary data store of said another of the servers of the cluster to the storage medium, when it is determined from said monitoring that said one of the clusters of the server is not operational. In this regard, Applicants refer the Examiner to the foregoing remarks regarding claims 11-15, 31 and 33, for example, as to why these further limitations are considered to be distinguishable from the cited combination of Massiglia, Sundar and Sunclus.

It is respectfully submitted that claim 32 is patentable over the cited reference(s) for the foregoing reasons.

CLAIMS 34-42

Claim 34-42 stand rejected as being unpatentable over Massiglia in view of Sundar and further in view of Sunclus for the reasons provided on pages 19-24 of the above referenced Office Action. Applicants respectfully traverse.

As was indicated above, the temporary data stores of the present invention cache the write data operation being inputted to both of the first and second data temporary data store. Thus, when it is determined that the write data operation being cached in the first temporary data store is successfully written to the storage medium, then according to the method of the present invention the write data operation that was being stored in the second temporary data store is deleted. However, if it is determined that the write data operation being cached in the first

temporary data store was not successfully written to the storage medium (*e.g.*, the server containing the first temporary data store failed), then according to the method of the present invention the write data operation cached in the second temporary data store is carried out and inputted to the storage medium.

The foregoing is not anywhere disclosed taught or suggested, in Massiglia, Sundar and Sunclus as herein described in more detail.

It is respectfully submitted that claims 34-42 are patentable over the cited reference(s) for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided by the Federal circuit, a 35 U.S.C. 103 rejection based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in a reference, is not proper and the prima facie case of obviousness cannot be properly made. In short there would be no technological motivation for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case it is clear that if the cited reference(s) were modified in the manner suggested by the Examiner it would destroy the intent, purpose or function of the device as taught by the reference.

As provided in MPEP 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F. 2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

As provided above, the references cited, alone or in combination, include no such teaching, suggestion or motivation.

Furthermore, and as provided in MPEP 2143.02, a prior art reference can be combined or modified to reject claims as obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Additionally, it also has been held that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. Further, and as provided in MPEP-2143, the teaching or suggestion to make the claimed combination and the reasonable suggestion of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As can be seen from the forgoing discussion regarding the disclosures of the cited references, there is no reasonable expectation of success provided in the reference. Also, it is clear from the foregoing discussion that the modification suggested by the Examiner would change the principle of operation of the device disclosed in the reference.

The Federal Circuit has indicated in connection with 35 U.S.C. §102 that in deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify *corresponding elements* disclosed in the allegedly anticipating reference (emphasis added, citations in support omitted). *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Company et al.*, 730 F. 2d 1452, 221 USPQ 481,485 (Fed. Cir. 1984). Notwithstanding that the instant rejection is under 35

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U.S.C. §103, in the present case the Examiner has not shown that the storage mediums of the cited and methodologies for replicating data using such mediums corresponds, as that term is used above by the Federal Circuit, in any fashion to the temporary data stores of the present invention, as well as the methods embodying use of such temporary data stores in its entire claimed form as set forth in any of the independent claims of the present invention.

It is respectfully submitted that for the foregoing reasons, claims 1, 7, 10-15, 20, 24-28 and 30-42 are patentable over the cited reference(s) and, therefore, satisfy the requirements of 35 U.S.C. §103. As such, these claims, including the claims dependent therefrom are allowable.

CLAIM 17

As indicated above, claim 17 was objected to because of an identified informality.

Claim 17 was amended as suggested by the Examiner. It thus is respectfully submitted that claim 17 is acceptable.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

Applicants believe that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed

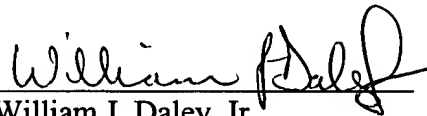
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for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit

Account No. **04-1105**.

Respectfully submitted,
Edwards & Angell, LLP

Date: August 9, 2004

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